F. NON-RIPARIAN GRASSLANDS (GA)

18. Indian Ricegrass-Needle-and-thread Ecological Series

Table 18-1. Full names and short names for the ecological types in the Indian Ricegrass–Needle-and-Thread Ecological Series.

Ecological Type Code	Ecological Type Name	Plant Association Code	Short Name
GA01	Indian ricegrass/needle-and-thread-blue grama–Moderately deep to shallow Aridic Mesic soils, gravelly surface–Convex windward summits and shoulders, 7,500–9,400 ft	ACHY/HECO26-CHGR15	Indian ricegrass/needle-and-thread–Aridic soils–Windswept ridge shoulders

The *Stipa hymenoides-Stipa comata* series is described as new here. It is closely related to the Indian Ricegrass-Galleta series of Donart and others (1978) and to the Galleta-Indian Ricegrass-Needlegrass series of Dick-Peddie (1993), but galleta (*Hilaria jamesii*) is very rare in the UGB. This series is also related to the *Agropyron spicatum* var. *inerme-Oryzopsis hymenoides* Great Basin grassland of Baker (1983), but bluebunch wheatgrass (now called *Pseudoroegneria spicata*) is apparently absent from the UGB. This series also includes part of the *Bouteloua gracilis* series of Francis (1986). *Bouteloua gracilis* is now called *Chondrosum gracile*. This series is very different from the Great Plains *Stipa comata* series of Hess (1981) and many others.

Stands usually occupy narrow, oval sites on the upper, windward sides of ridges, or narrow strips in the same locations. Stands are easily distinguished from sagebrush or serviceberry shrublands on aerial photographs, though they are sometimes difficult to distinguish from black sagebrush sites.

Vegetation, Climate, Soils

Hilaria jamesii (galleta), *Pseudoroegneria spicata* (bluebunch wheatgrass), and *Krascheninnikovia lanata* (winterfat) are all highly palatable to cattle, deer, domestic sheep, bighorn sheep, and most other herbivores. They are preferred over Indian ricegrass and needle-and-thread. Galleta was probably once more abundant in the UGB, but it is likely too cold here now. The UGB does not offer the well-drained alkaline sites necessary for bluebunch wheatgrass. For these reasons, the name of this series should perhaps be changed to *Stipa hymenoides-Hilaria jamesii* (Indian ricegrass-galleta), following Donart and others (1978). Before such a change is made, we need a better understanding of the grazing history of the UGB and other areas.

Parts of this series are called the *Ceratoides lanata* series by Francis (1986). Fautin (1946) called it the "*Eurotia-Oryzopsis- Microdipodops* Community," and Daubenmire (1970) named it the "*Eurotia lanata-Poa secunda* habitat type." Winterfat (KRLA2), called *Eurotia lanata* by Fautin and Daubenmire, and called *Ceratoides lanata* by Francis, is now more correctly named *Krascheninnikovia lanata*, by international agreement. Perhaps Francis is correct in calling these communities shrublands, but to maintain better alignment with previous usage of the terms 'grassland' and 'shrubland,' they should more properly be called grasslands. Regardless, these are communities of low to very low stature.

Table 18-2. Climate and Soils

Characteristic	Value	Reference
Precipitation zone	270 mm/yr (215 to 325 mm/yr) 10.7 in/yr (8.5-13 in/yr), Most of it during late winter and early spring	Kleiner and Harper 1972-1977, Cabral and West 1986, Francis 1986
Mean annual air temperature	7°C = 45°F	Cabral and West 1986

Winterfat was undoubtedly more abundant before European settlement (Fautin 1946). "Persistent and continuous overgrazing has measurably reduced this plant on many ranges and has completely destroyed it in others. In western Utah winterfat has been almost completely replaced on thousands of acres of overgrazed winter ranges by small rabbitbrush," what we call mid-height Douglas rabbitbrush (*Chrysothamnus viscidiflorus*) (Dayton and others 1937). Sometimes the invader in western Colorado is Parry rabbitbrush (*Chrysothamnus parryi*) (Terwilliger and Tiedeman 1978, Tiedeman and others 1987). Overgrazing also leads to soil erosion.

This series occupies the windward sides of ridges and mesas, usually on slope shoulders, and usually below lower treeline. Wind exposure is great, and the little snow deposited here blows off early (Tiedeman 1978). The lack of taller bunchgrasses in these habitats is apparently determined by landform and climate, not soils (Daubenmire 1970), and vegetation is composed of very short mat-forming shrubs. Plants are typically

low and sparse to very sparse; total live cover is usually less than 80% (Francis 1986, Aldon and others 1988). There is a conspicuous gravel pavement on the surface (Tiedeman 1978).

This series occurs on soils that are fairly permeable, usually sandy and/or gravelly. Winterfat prefers such soils (Dayton and others 1937, Fautin 1946); reinforcing the theory that winterfat was more abundant in the UGB on these sites before widespread livestock use began 120 years ago.

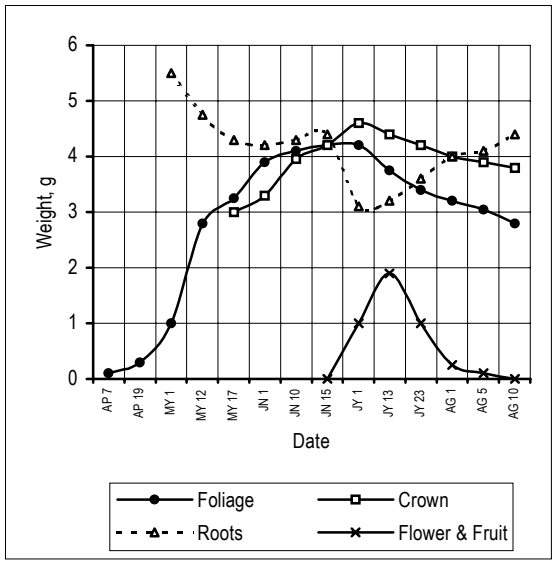


Fig. 18-1. Phenology of Indian ricegrass (ACHY) (Pearson 1979).

Insects and diseases are undocumented for this series.

These sites are very droughty and excessively dry due to the year-round wind, preventing adequate soil moisture recharge (Tiedeman 1978). Effective precipitation is considerably below that predicted on precipitation range maps. Very little deposition of organic material occurs, because of the wind and because the plants produce very little, so the soil develops very slowly. Plants are subjected to very low temperatures in winter due to the lack of snow cover (Tiedeman 1978). Cryptogamic crusts may have a significant role in soil protection and chemistry, especially in the top 5 cm of soil (Kleiner and Harper 1972, 1977ab).

Fire Management

Fire carries poorly through these sites, because there is so much gravel on the soil surface and productivity is low. Sites can be effective firebreaks. These sites are usually managed in combination with adjoining sagebrush sites.

Range and Wildlife Management

Cabral and West (1986) studied a stand of winterfat in Utah with three different stand histories (Table 18-3).

Table 18-3. Vegetation characteristics of a winterfat stand in Utah (Cabral and West 1986)

	Rabbit free[a]	Ungrazed[b]	Grazed[c]
Basal cover	15.6%	8.3%	8.4%
Canopy cover	143.1%	78.1%	69.2%
Plant density/m²	10.9	10.7	12.1
Weight/volume, g/cm³	0.008	0.011	0.010
Production, kg/ha/yr	981	578	433

a. Ungrazed ("rabbit free"), b. Ungrazed (livestock fenced out), c. Grazed (unfenced).

Snakeweed (GUSA2), mid-height Douglas rabbitbrush (CHVI8), and Parry rabbitbrush (CHPA13) increase with grazing; winterfat (KRLA2), Indian ricegrass (ACHY), blue grama (CHGR15), and galleta (HIJA, uncommon in the UGB) decrease with grazing pressure (Francis 1986). Sites in northern New Mexico at upper midseral and midseral stages produce forage for cattle at a rate of 250-400 lb/ac/yr (Aldon and others 1988).

Sparse stands of the windswept grassland type found in the UGB are an important component of low-elevation bighorn sheep winter range and intermediate range (but not in the summer-lambing range) west of Saguache near the UGB. Within the winter range, blue grama (*Chondrosum gracile*) and fringed sage (*Artemisia frigida*) are major components of bighorn diets in sparse grassland stands (Shepherd 1975).

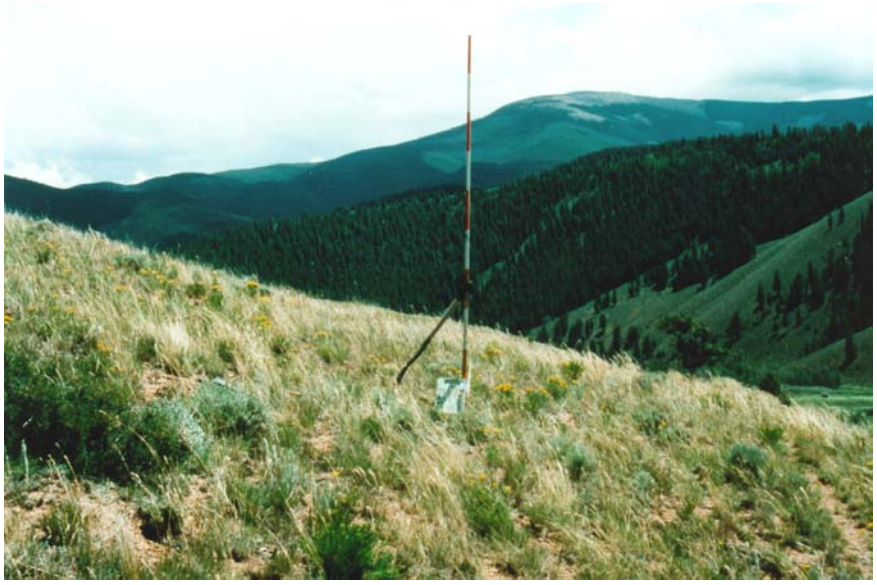
Recreation, Roads & Trails, Scenery

Sites are generally unsuitable and unattractive for roads and trails because of steep slopes and high winds. Though most of the soil is gravel, erosion is a major limitation. Sites are generally unsuitable and unattractive for developed or dispersed recreation, because of exposure and high winds.

Revegetation and Rehabilitation

Revegetation is extremely difficult due to harsh environmental conditions (Tiedeman 1978). Application of mulches is necessary to conserve soil moisture and help minimize erosion. "Planting, if in rows, should be perpendicular to the prevailing westerly wind in a rounded or corrugated furrow pattern. This furrowed surface would cause blowing soil material to settle in the depressions" (Tiedeman 1978, notice his tentative words here). Planted areas should be fenced for protection from livestock and big game.

Table 18-4. Characteristics of Ecological Types within Ecological Series 18 in the Upper Gunnison Basin. Numbers are shown in form *Average (Minimum-Maximum)*								
Code Short Name	**No. Samples**	**Elevation, ft**	**Avg. Aspect, °M (r) Slope, %**	**Soil Coarse, %**	**Depth, cm Mollic, cm**	**Surface: Coarse, % Bare, %**	**Cover, %: Trees Shrubs Graminoids Forbs**	**Total Live Cover, % No. Species TLC/NS, %**
GA01 Indian ricegrass/needle-and-thread–Aridic soils–Windswept ridge shoulders	18	8,511 (7,680-9,370)	240 (0.47) 18 (1-44)	59 (27-93)	54 (26-100) 16 (0-37)	51 (7-74) 14 (1-41)	0 (0-0) 8 (0-24) 67 (24-119) 15 (1-47)	89.3 (44.9-167.2) 27 (19-37) 3.4 (1.5-5.7)



An Indian ricegrass grassland (Community Type D). These sites occupy the upper windward side of north-south ridges and mesas in the foothills. Vegetation is often sparse, as soil formation must be very slow indeed. Not only does wind blow off snow and any fine particles, but the sites are colder than normal in the wintertime because they are unprotected by a blanket of snow. Nelson needlegrass 18%, pine needlegrass 16%, fringed sage 11%, needle-and-thread 10%, horsebrush 4%, pingue 3%, spiny gilia 2%. Coarse Fragments Cover = 47% (mostly gravel), Total Live Cover = 86%, Coarse Fragments in Soil = 23. Soil sampled as a Typic Argiboroll, Loamy-Skeletal, Mixed. Sargents Quadrangle, elevation 8,700 ft, 32% 244° (WSW) slope. July 21, 1992.

INDIAN RICEGRASS/NEEDLE-AND-THREAD–ARIDIC SOILS–WINDSWEPT RIDGE SHOULDERS

Indian ricegrass/needle-and-thread-blue grama–
Moderately deep to shallow Aridic Mesic soils, gravelly surface–
Convex windward summits and shoulders, >9,000 ft

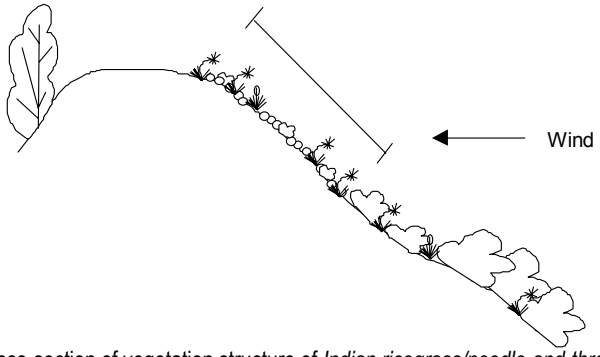


Figure 18-2. Cross-section of vegetation structure of *Indian ricegrass/needle-and-thread–Aridic soils–Windswept ridge shoulders*. Aspects are westerly, and slope angles average 17%.

Indian ricegrass/needle-and-thread–Aridic soils–Windswept ridge shoulders is a very common type in areas with Aridic soils outside the deep rainshadows. It is found on wind-scarred ridges in the lower part of the Gunnison Basin. This type probably occurs on both sides of the Continental Divide in Colorado, and perhaps elsewhere. *Indian ricegrass/needle-and-thread–Aridic soils–Windswept ridge shoulders* is characterized by Indian ricegrass (ACHY), blue grama (CHGR15), and needle-and-thread (HECO26). Many sites have plants such as needleleaf sedge (CASTE3), bottlebrush squirreltail (ELEL5), and fringed sagewort (ARFR4) as well. See Table 18-8 for common species names and codes. Other distinguishing features include location on wind-scarred ridges and shallow, gravelly soils.

Indian ricegrass/needle-and-thread–Aridic soils–Windswept ridge shoulders is closely related to *Arizona fescue/pingue–Shallow–Windward slopes*, which occurs at somewhat higher elevations, and has Arizona fescue (FEAR2) present. The habitats and plant communities of these two types overlap considerably, which might indicate that they are the same type. However, *Indian ricegrass/needle-and-thread–Aridic soils–Windswept ridge shoulders* occurs mostly outside rainshadows, and has slightly less-coarse soils. Conversely, *Arizona fescue/pingue–Shallow–Windward slopes* occurs mostly within partial rainshadows on slightly coarser soils.

The plant association *Achnatherum hymenoides/Hesperostipa comata-Chondrosum gracile* is described as new here, but it is perhaps similar to *Bouteloua gracilis/Stipa* spp. of Moir (1969).

Primary succession may take 1,000 years or more on these sites because of the unlikely possibility that fine soil particles, especially organic matter, would stay on these sites without being blown away. Because the sites are free of snow in the winter, they are colder than adjacent sites where snow affords some insulation from the air. Secondary succession is shorter, with a secondary sere of several centuries. However, sites which lack Indian ricegrass, the most palatable species, may be permanent disclimaxes from which grazing by wild or domestic ungulates has removed the ricegrass.

The early seral stage is very gravelly, with few plants, dominated by shallow-soil species such as needle-and-thread. Midseral stages (early midseral and midseral) are dominated by needle-and-thread with blue grama; Indian ricegrass may be present in small quantities. The late midseral stage is dominated by needle-and-thread, with some blue grama and more other deeper-soil grasses such as junegrass and squirreltail. Indian ricegrass may be present in small quantities. The late seral stage is dominated by a mix of bunchgrasses, with Indian ricegrass conspicuous, and a mixture of other deeper-soil grasses.

Cattle will sometimes graze these sites, but they are usually too far from water and too windy for sustained cattle use.

Wyoming big sagebrush or big sagebrush (not mountain) communities occur on adjacent deeper, less-gravelly soils on slightly more protected sites. Black sagebrush communities adjoin this type on shallower, clay soils. This type is never adjacent to riparian areas, and is seldom adjacent to serviceberry shrublands.

Horizontal obstruction varies from very low to low, but in spite of this, deer and elk may make intensive use of sites within their winter ranges, because the wind blows these sites free of snow all winter. In especially severe winters, these sites may be the only available sites free of snow. Deer will eat plants such as green rabbitbrush (CHVIP5), dwarf rabbitbrush (CHDE2), winterfat, and fringed sagewort (ARFR4) on these sites in winter, which is why these sites are an important part of deer and elk winter ranges.

Mule deer make moderate use of all community types during mild winters for rest, but only low use in severe winters. Deer use is moderate spring through fall, mostly for overnight stays. Elk use all community types moderately during mild winters for rest; their use is low in severe winters and spring through fall.

These sites are too windy and exposed and support too little cover to be of much use to sage grouse, though grouse make moderately low use of community types A and B for leks in spring, and high use for nesting; during the summer, their use is moderately high. Community types C and E receive moderately low use for leks in spring and moderately high use for nesting and in the summer. Community type D receives moderately low use for leks in spring, low use for nesting and moderately low use in summer by sage grouse.

Summary of Ecological Type Characteristics

1. Explanation of symbols in Appendix A. Percentages in [brackets] indicate the percentage of plots sampled that have that characteristic.

NUMBER OF SAMPLES	15, soil descriptions from 15; 1 not assigned to a CT (total 16)
ELEVATION	8,526 ft (7,680-9,370 ft); 2,598 m (2,341-2,856 m)
AVERAGE ASPECT	252°M (r = 0.47)
LITHOLOGY	Tuffs [45%], Granite [7%], and Breccias [7%] predominate, some sedimentaries
FORMATIONS[1]	Taf-Tpl [63%], Kdb-KJdm [21%], Xg-Xfh [21%]
LANDFORMS	Soil creep slopes [41%], Mesas and ridges [47%]
SLOPE POSITIONS	Mostly summits, shoulders, and upper backslopes [89%]
SLOPE SHAPES	Convex [75%] to linear [25%] horizontally, Mostly linear [75%] vertically
SLOPE ANGLE	16.0% (1-44%)
SOIL PARENT MATERIAL	Residuum [38%] or colluvium [31%]
COARSE FRAGMENTS	46.7% (0-73%) cover on surface, 58.8% (27-93%) by volume in soil
SOIL DEPTH	53 cm (26-100 cm); 20.9 in (10-39 in)
MOLLIC THICKNESS	17 cm (0-37 cm); 6.5 in (0-15 in)
TEXTURE	Mostly loamy (clay loam-loam-sandy loam [79%]) on the surface; subsurfaces are clayey to loamy, with clay-sandy clay [44%] or loam-sandy loam-sandy clay loam [39%]. Surfaces are usually very gravelly or gravelly, often cobbly or very cobbly as well.
SOIL CLASSIFICATION	Aridic Argiborolls [67%] or Lithic Haploborolls [20%]
TOTAL LIVE COVER	93.8% (52.4-167.2%)
NUMBER OF SPECIES	28.0 (21-37)
TOTAL LIVE COVER/NO. SPECIES	3.5% (1.5-5.7%)
CLIMATE	Hot in the summer, very cold in the winter, very dry (Aridic) Submontane. Evaporation from the surface (which is composed largely of coarse fragments) is significant because of the constant wind.
WATER	Precipitation is moderately low, but since the wind blows here nearly year-long, very little of that precipitation is available for plant growth. Soil is dry almost year-long.

Key to Community Types

1. Winterfat (KRLA2) evident, >5%..... (2)
1. Winterfat absent or <5%, usually <2% ..... (3)

2. Western wheatgrass (PASM) conspicuous, >15%. Total graminoid cover >85% ..... **B**
2. Western wheatgrass absent or minor, usually <10%. Total graminoid cover <80%..... **D**

3. Needle-and-thread (HECO26) usually dominant, >10% cover, often >25%. Pine needlegrass (ACPI2) absent or <10%. Snakeweed (GUSA2) absent to <1% cover..... (4)
3. Needle-and-thread minor, <10% cover. Pine needlegrass always present, >10% cover. Snakeweed present, >2% cover.....**C**

4. Total graminoid cover >85%. Total live cover >95% ..... **A**
4. Total graminoid cover <75%. Total live cover <95%..... **D**

Description of Community Types

A *Needle-and-thread-sedge-Sandberg bluegrass-sparse Indian ricegrass* is dominated by needle-and-thread, >35% cover, with conspicuous needleleaf sedge (CASTE3), bottlebrush squirreltail (ELEL5), and Sandberg bluegrass (POSE). Indian ricegrass is always present, but in small quantities, <5% cover. Shrubs are all minor, including green rabbitbrush (CHVIP5), up to 5% cover. Total graminoid cover is >85%, and graminoid production is >1,200 lb/ac/yr.

B *Needle-and-thread-winterfat-western wheatgrass* has conspicuous western wheatgrass (PASM), >15% cover, but is dominated by either blue grama (CHGR15) or needle-and-thread. Winterfat (KRLA2) is the only conspicuous shrub, >5% cover. Total graminoid cover is >90%, and graminoid production is >1,200 lb/ac/yr.

C *Snakeweed-pine needlegrass-needle-and-thread-blue grama* is dominated by snakeweed (>2% cover) and pine needlegrass (>15% cover). Pingue (PIRI6) and Indian ricegrass are also constant. Total graminoid cover is 30-60%, and graminoid production is 200-700 lb/ac/yr.

D *Needle-and-thread-sparse* is dominated by needle-and-thread, >10% cover, often >25%. Blue grama is sometimes codominant, 0-25% cover. Total graminoid cover is 20-70%, and graminoid production is 100-900 lb/ac/yr.

Communities Not Assigned to a Community Type

- A community dominated by Indian ricegrass (ACHY), with very little else, other species mostly <10% cover each. I would call this the PNC, except for the very low total live cover, indicating that the site has been depleted in some strange way.

Table 18-6. Community types within *Indian ricegrass/needle-and-thread–Aridic soils–Windswept ridge shoulders*.

Community Type	No. samples	Elevation, ft Slope, %	Coarseness, % Depth, cm Mollic Depth, cm	Surface Coarse, % Bare, % Seral Stage	Lr	Layer Height, m	Avg Layr Cvr %	Cover, %: Trees Shrubs Gramin. Forbs	No. Species Total Live Cover, % TLC/NS, %	Prod.[1], lb/ac/yr Shrubs Gramin. Forbs	Obstruct'n %: 1.5-2.0 m 1.0-1.5 m 0.5-1.0 m 0.0-0.5 m Total<2m
A. Indian ricegrass-bottlebrush	3	8,440 (8,209-8,782) 27.0 (24-29)	65 72 0	54 (35-74) 21 (8-34) LS	S GF L	0.15 (0.0-0.5) 0.19 (0.0-0.6) 0.0	0.6 87.2 2.9	0 (0-0) 11 (1-24) 49 (36-61) 7 (2-10)	23 (19-27) 66 (45-94) 3.0 (2.2-4.3)	12-480 255-782 24-112	0 (0-0) 0 (0-0) 0 (0-0) 13 (5-25) 3 (1-6)
B. Needle-and-thread-sedge-bluegrass-sparse Indian ricegrass	4	7,996 (7,680-8,520) 9.7 (2-17)	56 (27-77) 55 (32-100) 15 (0-28)	57 (22-71) 4 (1-7) LM	S GF L	0.15 (0.0-0.3) 0.20 (0.0-0.7) 0.0	18.9 84.3 26.6	0 (0-0) 1 (1-2) 110 (91-119) 20 (4-47)	29 (21-35) 130 (95-167) 4.6 (3.5-5.7)	11-37 1228-1330 44-337	0 (0-0) 0 (0-0) 1 (0-5) 40 (20-65) 10 (5-18)
C. Needle-and-thread-winterfat-western wheatgrass	2	8,585 (8,210-8,960) 4.0 (1-7)	53 (31-74) 79 (68-90) 32 (27-37)	48 (23-73) 9 (1-17) MS		*		0 (0-0) 9 (7-12) 104 (94-115) 11 (10-13)	24 (22-25) 125 (116-135) 5.3 (5.3-5.4)	140-238 1254-1327 105-143	0 0 0 45 11
D. Snakeweed-pine needlegrass-needle-and-thread-blue grama	3	8,663 (8,640-8,700) 39.9 (32-44)	61 (46-92) 52 (40-75) 10 (0-30)	53 (47-61) 19 (14-25) EM	S GF L	0.3 (0.0-0.5) 0.2 (0.0-0.7) 0.0	15.6 44.8 0.3	0 (0-0) 16 (13-21) 45 (38-52) 5 (1-12)	29 (22-35) 66 (52-86) 2.3 (1.7-2.7)	269-435 277-594 12-133	*
E. Needle-and-thread-sparse	6	8,790 (8,170-9,370) 12.2 (5-35)	62 (40-93) 44 (26-56) 16 (2-29)	44 (7-72) 16 (2-41) EM	S GF L	0.15 (0.0-0.5) 0.21 (0.0-0.6) 0.0	0.3 55.0 14.3	0 (0-0) 5 (0-9) 46 (24-65) 22 (12-36)	29 (22-37) 73 (55-93) 2.7 (1.5-3.8)	0-184 107-874 127-333	0 (0-0) 0 (0-0) 0 (0-0) 8 (0-20) 2 (0-5)

*. Unknown: measurements were not taken in this CT.

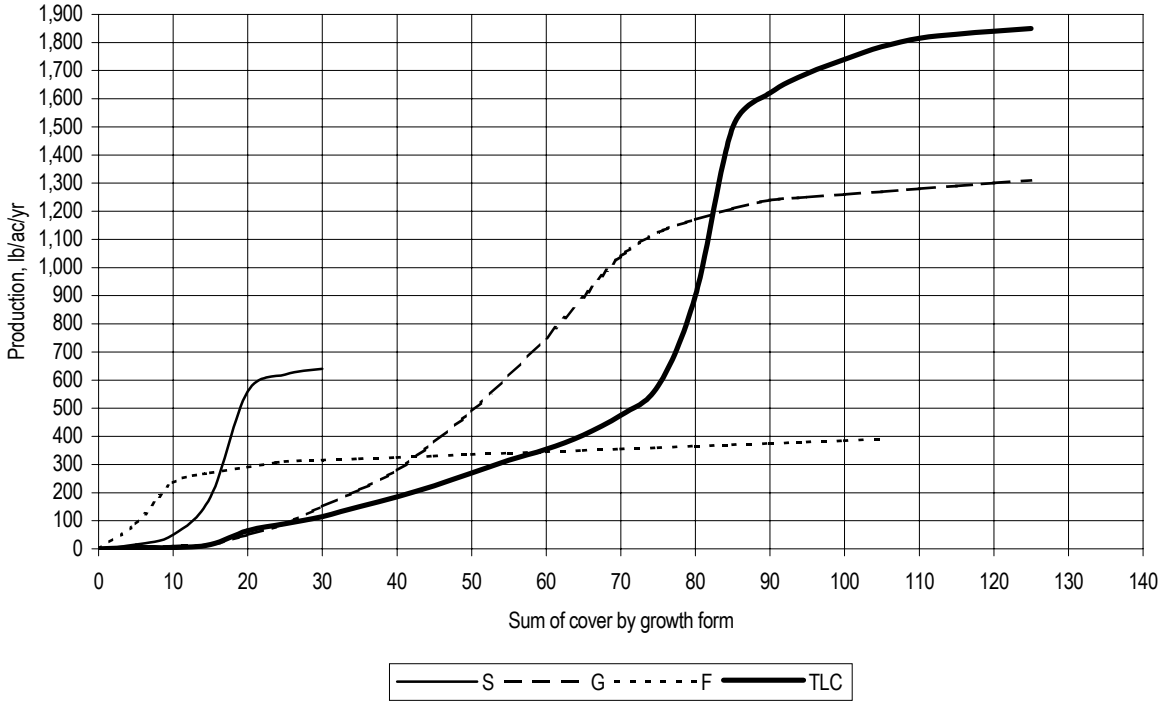


Figure 18-3. Relationship of cover by growth form and production. This is the ACHYFEAR (ACHY-FEAR2) model. S = shrubs, G = graminoids, F = forbs, and TLC = Total live cover.

Table 18-6. Wildlife values (relative to the whole UGB) for the principal wildlife species using *Indian ricegrass/needle-and-thread–Aridic soils–Windswept ridge shoulders*. "|" means the same as above.

CT	Sage Grouse Season–Preference	Mule Deer Season–Preference	Elk Season–Preference
A, B	Spring-Mod. Low (Lek) Nesting-High Summer-Mod. High	Winter, Mild-Moderate (Rest) Winter, Severe-Low Spring/Fall-Moderate (Overnight)	Winter, Mild-Moderate (Rest) Winter, Severe-Low Spring/Fall-Low
C, E	Spring-Mod. Low (Lek) Nesting-Mod. High Summer-Mod. High	|	|
D	Spring-Mod. Low (Lek) Nesting-Low Summer-Mod. Low	|	|

Table 18-7. Resource Values for *Indian ricegrass/needle-and-thread–Aridic soils–Windswept ridge shoulders*. Resource values were calculated from the numbers in Table 18-5, relative to the whole UGB.

The numbers in this table can be translated: 0 = Very Low, 1 = Low, 2 = Moderately Low, 3 = Moderate, 4 = Moderately High, 5 = High, and 6 = Very High.

	Community Type			
Resource Value	**A**	**B**	**C**	**D**
Potential Cattle Forage Production	4	4	1-2	1-2
Grazing Suitability	4	4	2	2
Wetland	No	No	No	No
Riparian Area	No	No	No	No
Developed Recreation	1-2*	1*	0*	1*
Dispersed Recreation	0-1	0-1	0	0-1
Scenic	0-1	0-1	0-1	0-1
Road & Trail Stability	4-5	4-5	2-3	3
Construction Suitability	1-2*	1*	0*	1*
Deer & Elk Hiding Cover	0-1	0-1	0-1	0
Deer & Elk Forage & Browse	1-2	1-2	1	1
Need for Watershed Protection	1	1	1	1
Soil Stability	4-5	4-5	2-3	3
Risk of Soil Loss-Natural	3-4	3-4	4-5	3-4
Risk of Soil Loss-Management	2	2	3-4	2
Risk of Permanent Depletion-Range	1	1	1	1
Risk of Permanent Depletion-Wildlife	4-5	4-5	2-3	2-3
Resource Cost of Management	4-5	4-5	2-3	2-3
Cost of Rehabilitation	2	2	2	2

*. Not very suitable because too windy and exposed

A low grassland dominated by winterfat, the silvery-gray low shrub (not classified as a community type). This site is intensively used in the spring and summer by sage grouse for feeding on winterfat and fringed sagewort. Winterfat averages 26.9 cm (10.6 in) tall and 32% cover, fringed sagewort averages 39% cover. Aspect 344° mag. (NNW), 24% slope. Razor Creek Dome Quadrangle, elevation 8,725 ft, 24% 344° (NNW) slope. July 28, 1998.

Table 18-8. Common Species in *Indian ricegrass/needle-and-thread–Aridic soils–Windswept ridge shoulders*, where Characteristic cover > 10% or Constancy > 20%. "–" means that the species is not found. Dead cover is not listed. Ccv = Characteristic Cover, Con = Constancy. If Avc = Average Cover, then these are related using the formula Avc = Ccv•100%/Con.

	Community Type	A	B	C	D	E	
		Ccv(Con)	Ccv(Con)	Ccv(Con)	Ccv(Con)	Ccv(Con)	
Code	Species	N = 3	4	2	3	6	Common Name
	SHRUBS						
ARNO4	Artemisia nova	1 (33)	T (25)	T (50)	3(100)	T (17)	black sagebrush
CHDE2	Chrysothamnus depressus	11 (33)	– –	– –	– –	– –	dwarf rabbitbrush
CHVI8	Chrysothamnus viscidiflorus	3 (33)	T (25)	– –	– –	4 (33)	Douglas rabbitbrush
CHVIP5	Chrysothamnus viscidiflorus ssp. pumilus	1 (67)	1 (75)	– –	– –	T (50)	green rabbitbrush
GUSA2	Gutierrezia sarothrae	– –	– –	1 (50)	5(100)	T (33)	broom snakeweed
KRLA2	Krascheninnikovia lanata	2 (67)	1 (50)	9(100)	– –	3 (67)	common winterfat
PIRI6	Picradenia richardsonii	2 (33)	– –	– –	2(100)	4 (50)	pingue
PUTR2	Purshia tridentata	– –	– –	– –	2(100)	T (17)	antelope bitterbrush
TECA2	Tetradymia canescens	3 (67)	– –	1 (50)	2 (67)	1 (50)	gray horsebrush
	GRAMINOIDS						
ACHY	Achnatherum hymenoides	44(100)	1(100)	T (50)	4(100)	T (67)	Indian ricegrass
ACNE9	Achnatherum nelsonii	– –	– –	– –	18 (33)	– –	Nelson's needlegrass
ACPI2	Achnatherum pinetorum	– –	9 (25)	– –	17(100)	4 (33)	pine needlegrass
CASTE3	Carex stenophylla ssp. eleocharis	– –	26(100)	– –	– –	5 (50)	needleleaf sedge
CHGR15	Chondrosum gracile	– –	4 (75)	63 (50)	6(100)	9 (83)	blue grama
ELEL5	Elymus elymoides	T(100)	7(100)	5(100)	1(100)	2(100)	bottlebrush squirreltail
FESA	Festuca saximontana	– –	– –	– –	– –	10 (17)	Rocky Mountain fescue
HECO26	Hesperostipa comata	8 (33)	54(100)	37(100)	9(100)	23(100)	needle-and-thread
KOMA	Koeleria macrantha	1 (33)	12 (50)	– –	1 (33)	1 (33)	prairie junegrass
PASM	Pascopyrum smithii	2 (67)	4 (25)	31(100)	– –	4 (50)	western wheatgrass
POSE	Poa secunda	– –	7(100)	– –	1(100)	5 (50)	Sandberg bluegrass
	FORBS						
ANSE4	Androsace septentrionalis	– –	16 (50)	– –	– –	T (33)	northern rock-jasmine
ARFR4	Artemisia frigida	T(100)	2 (75)	8(100)	4(100)	6 (83)	fringed sagewort
ERCO27	Erigeron concinnus	– –	T (75)	– –	– –	3 (67)	Navajo fleabane
EREA	Erigeron eatonii	– –	T (25)	T (50)	1 (33)	1 (33)	Eaton fleabane
GADI2	Gayophytum diffusum	– –	17 (25)	– –	– –	– –	spreading ground smoke
PASE	Paronychia sessiliflora	1 (33)	T (25)	– –	– –	6 (33)	creeping nailwort
PHHO	Phlox hoodii	– –	3 (50)	4 (50)	– –	6 (67)	Hood's phlox
POPE8	Potentilla pensylvanica	– –	T (50)	– –	– –	1 (33)	Pennsylvania cinquefoil
SCLI	Schoenocrambe linifolia	– –	T (25)	– –	T(100)	– –	skeleton mustard
SPCO	Sphaeralcea coccinea	1 (33)	1 (50)	2 (50)	– –	3 (50)	scarlet globe mallow
TETO	Tetraneuris torreyana	T (67)	1 (50)	T (50)	– –	4 (17)	Torrey's hymenoxys
TRGY	Trifolium gymnocarpum	– –	4 (25)	T (50)	– –	1 (33)	holly-leaf clover
	GROUND COVER						
.BARESO	bare soil	21(100)	4(100)	9(100)	19(100)	16 (83)	
.LITTER	litter and duff	25(100)	38(100)	42(100)	30(100)	37 (83)	
GRAVEL	gravel 0.2-10 cm	21	18	18	25	20	
.COBBLE	cobble 10-25 cm	10(100)	17(100)	21 (50)	3(100)	11 (67)	
.STONES	stone > 25 cm	2 (67)	4 (75)	4 (50)	– –	1 (33)	
.MOSSON	moss on soil	T (33)	7 (25)	– –	– –	1 (17)	
LICHENS	lichens on soil	T	2	27	1	10	